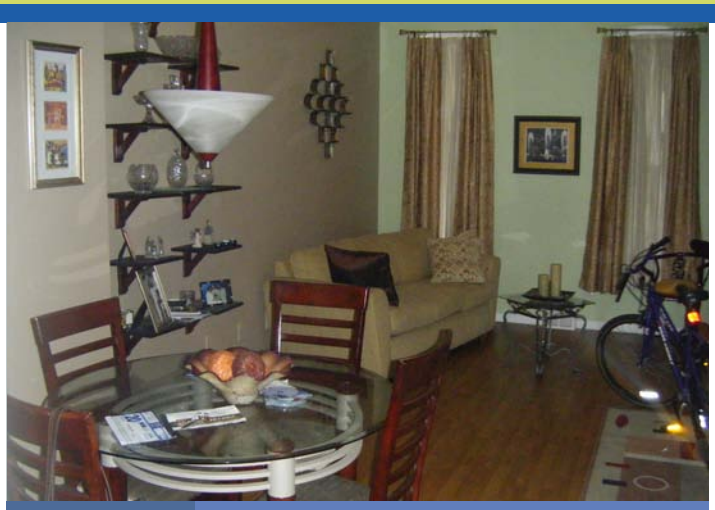
EnergyWorks

PROFILES in ENERGY EFFICENCY
GREATER PHILADELPHIA REGION

MORRIS RESIDENCE

Philadelphia, PA



BUILDING BACKGROUND

MORRIS RESIDENCE
Philadelphia, PA

BUILDING USAGE
Single-Family Residence

SIZE
2178 sq. ft.

STORIES
3

YEAR PURCHASED
1982

START YEAR FOR ENERGY MANAGEMENT
2006

ENERGY EFFICIENCY TYPOLOGY
Air Sealing and Insulation, Furnace Repair, Dehumidifier, White Roof, Programmable Thermostat

CONTRACTOR INFORMATION

TR Insulation
3009 Mount Carmel Ave
Glenside, PA 19038
215.887.5259
trinsulation.com

BQ Basement Systems
525 Bethlehem Pike
Erdenheim, PA 19038
1.800.339.2070
bqbasementsystems.com

OVERVIEW AND SCOPE

The Residence

Tanya Morris lives in a three-story row home in the Philadelphia neighborhood of Belmont. The house was gutted and rehabbed in 2005. Due to these renovations, the Morris home was more energy efficient than the average Philadelphia home, but there were still several areas that needed improvement. Morris, an Energy Coordinating Agency (ECA) employee, wanted to take advantage of the EnergyWorks program, which is administered by ECA, because she was interested in learning more about energy efficiency improvements in homes.

EnergyWorks is a program funded by a grant from the U.S. Department of Energy. EnergyWorks connects home and business owners with rebates, tax credits, and low-interest loans to perform energy efficiency improvements. Through EnergyWorks, Morris was able to receive a rebate on her home energy assessment by implementing at least $1,000 of the improvements recommended. For more information, visit EnergyWorksNow.com/.

PROJECT DETAILS

ECA's auditors performed an energy assessment on Morris' home. A blower door test was conducted first, which revealed that the home was almost 2.5 times leakier than the standard. The air leakage represents the equivalent of a 15 by 15 inch hole in the house. A house should exchange about 1/3rd of the volume of air it has inside of it every hour in order to move indoor pollutants, excessive moisture, and other harmful particles out of the house. However, if the air is exchanged more frequently, the heating and cooling system must use more energy to heat or cool the new air being introduced. The blower door test, as well as infrared scanning, helped to pinpoint excessive air leakages in Morris' home.

Air Sealing and Insulation

Morris' basement was especially prone to temperature fluctuations, so TR Insulation was hired to conduct air sealing

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along the perimeter of the basement, especially around electrical, water, and gas piping, and venting ducts. The weather stripping around the front door was also worn away, so TR Insulation replaced the weather stripping in order to create a tight seal on the home. Morris also had low-cost, high R-value cellulose blown into her attic to increase the comfort level of her home. R-value is a measure of resistance to heat flow. The higher the R-value, the greater the effectiveness of the insulation.

Furnace and Filter

Morris' furnace also had a number of issues. Several of the parts were corroded due to high levels of moisture in the basement. The filter needed to be replaced and since the filter slot did not have a proper door, dirty and moist air from the basement was getting into the circulation system and degrading the air quality in Morris' home. BQ Basement Systems constructed a door for the filter and installed a dehumidifier in Morris' basement to decrease the moist air's impact on the mechanical systems and improve the home's air quality.

White Roof

ECA installed a white acrylic, elastomeric, or "cool," roof coating on Morris' flat roof. These reflective coatings help a home maintain a lower temperature during the summer and reduce the urban heat island effect. With white roofs, about 80% of sunlight is reflected, as opposed to a dark roof, where 95% of sunlight is absorbed. The white roof is highly reflective and emissive and allows less heat to be absorbed into the home. This is important because high roof temperatures can also cause roofing materials to deteriorate faster. Cool roof coatings reduce cooling costs by approximately 20%.

Programmable Thermostat

Morris had a programmable thermostat installed in her home, which allows her to regulate her home's temperature throughout the day depending on her schedule. A programmable thermostat can reduce energy costs by adjusting the home's temperature to reduce heating and cooling demand when the home is not in use or when residents are sleeping.

PECO Smart A/C Saver Program

Morris participated in the PECO Smart Ideas A/C Saver program. Through this program, PECO technicians install a switch that allows them to turn off your air conditioning during times when there is high energy demand. This helps to prevent blackouts or brownouts during the summer, and by participating in this program, you can earn credits of up to $120 on your PECO bill.

PROJECT OUTCOME

A blower door test was conducted after the work was done, and the air leakage had dropped 20%. More advanced air-sealing techniques, such as dense packing or foaming wall cavities, could have resulted in a 40-60% air leakage reduction, so there are still opportunities to further tighten Morris' home. Morris reported that her home is already much more comfortable, and because of the new dehumidifier and filter, the indoor air quality is much better, as well.

PROJECT OUTCOMES

Annual Electricity Savings	$51
Annual Gas Savings	$165
Total Annual Savings (9%)	**$215**

ENERGY SAVING INVESTMENTS

Furnace Repairs	$200
Air Sealing and Insulation	$350
Dehumidifier	$1800
White Roof	$600
Total	**$2950**